

### **REMARKS**

Claims 19-30 are pending in this application. Claims 19-31 are rejected. Claims 19-21 are herein amended. Claim 31 has been canceled. Reconsideration of the rejections in view of these amendments and the following remarks is respectfully requested.

#### **Rejections under 35 USC §112, Second Paragraph**

Claims 19-31 are rejected under 35 USC §112, second paragraph, as being indefinite because, in claims 19, 20, 21 and 31, there are no units for the hardness value, rendering all the claims indefinite.

The claims have been amended to overcome these rejections. In the amendment, Hv has been added. The unit of Vickers hardness value Hv is disclosed in Table 2.

#### **Rejections under 35 USC §102(b)**

Claim 31 is rejected under 35 USC §102(b) as being anticipated by Vaz et al (*Physical, ... films*).

Claim 31 has been cancelled and the rejection has become moot.

#### **Rejections under 35 USC §103(a)**

Claims 19-30 are rejected under 35 USC §103(a) as being obvious over Vaz et al in view of Kukino et al (U.S. Patent No. 5,700,551).

Admitting that Vaz et al does not disclose TiN film including Cr, Zr, Hf, or B, the Examiner alleged that Kukino et al discloses that it is known to include these components in TiN

films to produce cubic films and that it would have been obvious to substitute Si in Vaz et al with the claimed component as these components are known in the coating art to behave as Si, as shown by Kukino et al. Kukino et al, however, describes Cr, Zr, Hf, B and Si for example as follows:

The compound whose crystal, structure is cubic system is preferably nitride, carbide or carbonitride containing at least one element selected from a group comprising Ti, Zr, Cr, V, Hf, Al and B. The compound whose crystal structure is **not cubic system** or of amorphous is preferably or of amorphous is preferably nitride, carbide or carbonitride containing at least one element selected from a group comprising Al, Si and B, in particular aluminium nitride (AlN).

(Column 2, lines 45-53, emphasis added); or

Nitride, carbide and carbonitride of Ti, Zr, Cr, V or Hf have a crystal structure of cubic system and possess improved hardness, heat-resistance, resistance to oxidation and chemical resistance. Therefore, these materials are suitable to prepare the ultrafine particle-layered film according to the present invention. Nitride, carbide and carbonitride of their alloys or alloy with Al are suitable because it is known that they are better in the above-mentioned properties.

(Column 5, lines 44-51). These descriptions merely indicate that nitride of Ti, Zr, Cr, V or Hf have a crystal structure of cubic system. The term "nitride of Ti, Zr, Cr, V or Hf" includes TiN and all nitrides are described as equivalents. Moreover, while nitride of Ti, Zr, Cr, V or Hf is described as having a crystal structure of cubic system, the nitride containing Si is described as a preferable compound whose crystal structure is **not cubic system** or of amorphous. Nothing in Kukino et al indicates that Cr, Zr, Hf, or B improves properties of TiN film. Therefore, there is no reason or motivation for a person of ordinary skill in the art to substitute Si in Vaz et al with the claimed component shown by Kukino et al.

For at least these reasons, claims 19, 20 and 21 patentably distinguish over Vaz et al and Kukino et al. Claims 22-30, depending from claims 19, 20 and 21, also patentably distinguish over these references.

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Reply to Office Action of September 8, 2003

It is submitted that nothing in the cited references, taken either alone or in combination, teaches or suggests all the features recited in each claim of the present invention. Thus all pending claims are in condition for allowance. Reconsideration of the rejections, withdrawal of the rejections and an early issue of a Notice of Allowance are earnestly solicited.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. The fees for such an extension or any other fees which may be due with respect to this paper, may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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